



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/807,052	03/22/2004	Hajime Shirakawa	P/1596-74	2685
2352	7590	10/19/2006		
OSTROLENK FABER GERB & SOFFEN 1180 AVENUE OF THE AMERICAS NEW YORK, NY 100368403				
			EXAMINER ALANKO, ANITA KAREN	
			ART UNIT 1765	PAPER NUMBER

DATE MAILED: 10/19/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/807,052	SHIRAKAWA ET AL	
	Examiner	Art Unit	
	Anita K. Alanko	1765	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 8/7/06 amdt.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 11-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 11-22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 11-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shekel, Hartman and Thompson (WO 2003/027647 A1) in view of JP 2001-189297.

Shekel discloses an apparatus comprising:

a treating tank for immersing the substrates in a treating liquid stored therein (page 25, lines 32-33);

a holding arm for holding the substrates (robotics, page 26, lines 10-11), said holding arm being movable to a treating position in said treating tank for immersing the substrates in the treating liquid;

a storage device 130 (Fig.3A) which stores

(a) a relationship between use history, treating rate of the treating liquid (page 31, lines 25-26; page 32, line 4 – the relationship is the “connection” between the etch rate and spectra), and

(b) an up-to-date use history of the treating liquid (inherent since have real-time control, and multiple ages of baths are accounted for and used in the model, for example processed wafer history includes bath history, page 35, lines 3-4); and

a calculating device which derives a current treating rate from (a) and (b) (Fig.3B, step 340; see also page 23, lines 4-6: Shekel discloses to determine an etch rate of a substance based on the disappearance or appearance of the chemical (page 23, lines 4-6), which encompasses calculating a current treating rate.).

Shekel does not explicitly disclose that the holding arm is for holding the substrates in vertical posture. JP 2001-189297 teaches that holding substrate in vertical posture is a useful configuration (Fig.4, 7). It would have been obvious to one with ordinary skill in the art have the holding arm for holding the substrates in vertical posture in the apparatus of Shekel because JP 2001-189297 teaches that this is a useful way hold substrates when immersing in treatment baths.

Shekel does not disclose computing means for determining a corrected treating time by the equation cited in claim 11. Rather, Shekel uses the current treating rate to control the apparatus so that the treating rate stays within a predetermined range (page 40, lines 6-13). However, it would have been obvious to one with ordinary skill in the art, since Shekel determines the use history for a fresh portion of treating liquid, the etch time for a fresh portion

of treating liquid, and the use history for the current treating liquid, to use the equation cited to determine a corrected treating time because, since, as Shekel teaches, etchants get loaded with by-products with time and their etching rate slow with time, that the corrected time will be extended and therefore the simplest way to correct a known fresh etchant time is multiplication by a factor, which factor is obvious to be the relative etch rates of a fresh to current etch rate. It is obvious to use the cited equation since Shekel teaches that etchants slow with time, and to increase the yield it is obvious to extend the time so that the etchant may be more efficiently used.

In addition, as to the wherein clauses of claims 12-20, the apparatus of Shekel is capable of performing these functions and therefore these functions do not patentably distinguish the claimed invention.

As to claims 12-13, the apparatus of Shekel takes into account, at least, the treated number of substrates and type of substrates (page 33, lines 26-27).

As to claims 17-20, Shekel discloses hydrofluoric acid (page 31, line 29), however the bath is capable of holding phosphoric acid.

Claims 17-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shekel, Hartman and Thompson (WO 2003/027647 A1) in view of JP 2001-189297 and Schnegg (US 4,971,654).

As to claims 17-20, Shekel discloses hydrofluoric acid (page 31, line 29), however the bath is capable of holding phosphoric acid. Schnegg teaches that phosphoric and hydrofluoric acids are useful acids for etching substrates (col.8, lines 21-26). It would have been obvious to

one with ordinary skill in the art to have a treating liquid which comprises phosphoric acid and hydrofluoric acid in the apparatus of Shekel because Schnegg teaches that they are useful etchants for substrates.

Response to Amendment

The rejection of claims 14-16 under 35 U.S.C. 112, second paragraph is withdrawn since claim 14 has been amended to cite a computing device.

Phan is no longer applied in the rejection. Claims 11-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shekel, Hartman and Thompson (WO 2003/027647 A1) in view of JP 2001-189297.

Claims 17-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shekel, Hartman and Thompson (WO 2003/027647 A1) in view of JP 2001-189297 and Schnegg (US 4,971,654).

Response to Arguments

Applicant's arguments filed 8/7/06 have been fully considered but they are not persuasive. Examiner acknowledges that Shekel does not disclose the cited corrected treating time, however it is obvious to one with ordinary skill in the art. Shekel teaches to determine all the separate parts of the equation (a use history, an updated use history and an etch time for a fresh batch). It is obvious to use the cited equation since, as described above, Shekel teaches that etchants slow with time, and to increase the yield it is obvious to extend the time so that the etchant may be more efficiently used.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anita K. Alanko whose telephone number is 571-272-1458. The examiner can normally be reached on Mon-Fri until 2:30 pm (Wed until 11:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine Norton can be reached on 571-272-1465. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1765

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Anita K. Alanko

Anita K Alanko

Primary Examiner

Art Unit 1765